

SCIENTIFIC SERIALS

Justus Liebig's Annalen der Chemie und Pharmacie. Band 171, Heft 2 und 3.—These parts contain the following papers:—On aldehyde derivatives of naphthylamine, by Dr. G. Papasogli. Naphthylamine sulphite gives with benzaldehyde naphthylamine-benzoyl bisulphite, $C_{10}H_7N.SH_2O_3.C_7H_6O$. This substance is decomposed on heating into sulphur dioxide, water, and a resinous substance of the formula $C_{17}H_{13}N$.—Action of amides on phenol, by Dr. J. Guareschi. The author has tried the action of benzamide and acetamide, also the action of benzamide on cresol, on methyl salicylate, and on ethyl salicylate.—The same author contributes a paper on the various cymenes. Seventeen of these bodies are described and tabulated with bibliographical references. Franz Meilly contributes a long paper on aconitic acid, to which substance the author assigns the

constitutional formula $\begin{array}{c} CH \\ || \\ C-CO \diagup O \\ | \\ CH_2CO_2H \end{array}$.—The following are commu-

nications from the laboratory of applied chemistry of Hilger's University:—On Bavarian eclogite by Dr. Gerichten.—On a method of analysing crystalline minerals, by the same.—On a titaniferous iron of abnormal composition, by the same.—On abnormal constituents of urine after taking asparagus, by A. Hilger.—The solubility of tellurium and selenium in sulphuric acid, by the same.—On the quantitative determination of iodine in urine, by the same.—“Synthesis of Phenylbutylene” is the title of a lengthy paper by B. Aronheim. The author has also accomplished the synthesis of naphthalene.—Under the heading, “Researches from the Chemical Laboratory of Kasan, communicated by Alexander Saytzeff,” we have the following papers:—On an isomeric pyrotartaric acid, by A. Tupoleff. The acid is ethyl-malonic acid.—On the ether of monobrombutyric acid, by the same.—On some sulphur derivatives of the primary butylic alcohols, by N. Grabowsky and Alexander Saytzeff.—On the reduction of succinyl chloride, by A. Saytzeff. The chief pro-

duct of the reduction is succinic aldehyde $\begin{array}{c} CH_2COH \\ | \\ CH_2COH \end{array}$ which, by the action of caustic bases, yields a new oxybutyric acid CH_2CH_2OH .

—Contributions towards the determination of the structural formulæ of the allyl compounds of acrylic acid, by E. Linnemann.—Contributions to the history of the orcinis.—IV. On the iodo-derivatives of the orcinis, by John Stenhouse. This paper has already appeared in the Proceedings of the Royal Society.—Researches on the allyl group.—XIII. On α -dibromopropionic acid, by O. Philippi and B. Tollens.—XIV. On α -monobromacrylic acid and conversion of α -dibromopropionic acid into the β acid, by the same authors.—XV. On β -monobromacrylic acid from β -dibromopropionic acid, by R. Wagner and B. Tollens.—XVI. By-products of the preparation of β -monobromacrylic acid, by the same.—F. Mohr contributes a lengthy paper on the theory of dissociation or thermolysis. Among other views the author opposes in severe terms that of Horstmann, who has introduced the idea of entropy into the theory of dissociation.—The concluding paper is by J. J. van Renesse, On octylic and caprylic acids.

Bulletin de l'Académie Royale des Sciences, &c., de Belgique, sér. 2, t. xxxvii., No 4.—Mr. A. Gilkinet gives the first of a promised series of papers on the morphology of the Pyrenomyces. This instalment of twenty-three pages with two plates is occupied with *Sordaria fimicola* (Cesati and De Notaris), which he identifies with *Sphaeria equina* (Fueckel). His observations confirm those made by M. Woronin on *Sordaria fimiseda*, showing that these fungi are sexual. The development and structure of the male and female organs are minutely given.—Dr. F. Putzeys contributes a paper On the centres of vaso-motor nerves. Where are the nerve-centres which affect the tonicity of blood-vessels? is the question he endeavours to solve. His experiments made upon a frog are carefully detailed. He shows that its spinal marrow possesses a reflex vaso-motor power throughout its entire length, thus confirming the work of Schlesinger, Goltz, Freusberg, and Vulpian. Until lately the tonicity of blood-vessels was believed to be under the control of the medulla oblongata alone.—There is a short note by M. Edward Morren, On the application of the mechanical theory of heat to the growth of plants. M. Barthélemy, Professor of Physics at

Toulouse, had recently said that he noticed last July a bamboo in the Jardin des Plantes at Montpellier, which grew a centimetre an hour. Such growth, he remarked, must be coincident with the fixture of carbon. M. Morren by no means sees that this follows. He says, “Carbon fixed in the green organs of plants under the influence of the sun's rays, by the decomposition of carbonic acid, is not immediately applied to the formation of the tissues by which new organs are formed. The materials of growth are furnished by organic material already elaborated, and their application to the requirements of growth is accompanied by an expenditure of force requisite for their circulation and transformations.” Often when we can see plants growing they are not fixing any carbon. Tubers, bulbs, buds, and seeds when sprouting not only do not fix carbon, but lose some. This is in consequence of their respiration, and it is the heat furnished by this combustion which occasions the motions by which they sprout.—There are four chemical papers by M. Louis Henry: On the dry distillation of lactic acid; On propargyl; On chloro-bromo-propionic acid; On glycerine derivatives.—There is also a note On systematic international meteorological observations.

Zeitschrift der Österreichischen Gesellschaft für Meteorologie.—No. 8 of vol. ix. contains papers by Messrs. Wild, Hany, and Jelinek on methods of reduction to sea-level of barometric readings.—Dr. Ebermayer concludes his notice of Lorenz and Rothe's new “Handbook of Climatology.” The second volume is by Dr. Lorenz alone. The “Provinces” into which he proposes to divide Europe are Subarctic, Pontic, Baltic, North and South Oceanic, and Mediterranean. The causes of modifications of climate are discussed and grouped according to their relative importance, and though the greater part is devoted to Europe, a short sketch of characteristics of climate of Asia, Africa, America, and Australia is given.—The space devoted to short articles is occupied with a notice of Bruhn's meteorological observations at Leipzig.

Astronomische Nachrichten, Nos. 1,991, 1,992.—These numbers contain a long paper by E. Schönfeld, giving the periods of maximum and minimum of a number of variable stars, with a short history of each. The elements of planet (136) are given as follows:—

Epoch April 1874, 0^h0 Berlin time.]

$M = 225^{\circ} 29' 2''$

$\pi = 331^{\circ} 0' 0''$

$\Omega = 185^{\circ} 53' 4''$

$i = 11^{\circ} 30' 4''$

$\phi = 8^{\circ} 23' 2''$

$\mu = 1007'' 86$

Log. $a = 0.36442$.

Memorie della Società degli Spettroscopisti Italiani, March.—This number contains a letter of Prof. B. Wolf, On the maxima and minima of solar spots. He refers to the value 11.111 years for the period, as given by him in 1852, and now finds from further data the period of minima to be 11.114 years, and that or maxima 11.060 years. He claims to have proved the connection between the above periods, and the magnetic and auroral disturbances. A diagram accompanies this number of the chromosphere, for Sept. 1872, and J. Tacchini contributes a paper On some spectroscopic considerations, in which he gives the method he employs for viewing the prominences with a tangential slit, accompanied by drawings.—To this number is an astronomical appendix, containing a paper by Prof. Schiaparelli, On the eleven-year period of the variation of terrestrial magnetism, considered in relation to the frequency of solar spots, to which is added a table showing at once the connection of the two phenomena, from the year 1836.

Der Naturforscher, April. This number consists of *résumés* of papers read before Societies, &c., most of which we have already noticed. Students of the Prehistoric period will find a long article from the *Mittheilungen der Antiquarischen Gesellschaft in Zürich*, on art workmanship of the reindeer period in Switzerland.

Bulletin de la Société d'Acclimatation de Paris, May.—A very practical paper on acclimatisation opens the May number, in which M. J. M. Cornély gives an account of his experiments in inducing kangaroos, wombats, llamas, marmots, Angora goats, and several new varieties of birds and plants to find a congenial home in the soil and climate of France. The former animals would seem to be fully acclimatised, and promise to be a valuable acquisition.—Brazil now seems to enter into the com-

petition with new varieties of silkworms, which are described as possessing many qualities which will render them a most useful addition to the various silkworms now under cultivation.—The Society has been successful in securing two specimens of a fish called the Gourami, from Singapore; attempts have been made to procure some of these fish for introduction into this country, but they have as yet been unsuccessful. The introduction of the *Diospyros*, a Chinese fruit-tree, is recommended, and attempts are being made to acclimatise it.—M. Millet is endeavouring to secure some means of foretelling the approach of cold weather in the spring months, and asks for any observations on the point which others may have made.—An interesting paper by M. J. Lapru, on the Italian bee, points out the superior qualities of that insect, and suggests its more general cultivation.

Jahrbuch der kais. kön. geologischen Reichsanstalt. Band xxiii. Nos. 3 and 4.—The first paper in No. 3 is by Dr. O. Feistmantel On the relation of the Bohemian carboniferous formation to the permian. The palæontological and physical evidence enables the author to arrange these formations as follows:—I. Permian formations. *a* Upper group (with two stages) consisting of red sandstone with bituminous shales, containing animal remains, and red shales with various plant-remains; marl, limestone, and calcareous shales with abundant animal remains. *b* Lower group, or permanent coal-bearing group, containing coal-seams, generally accompanied with bituminous shales. The beds yield permian animal remains, and a rich flora almost entirely non-carboniferous. Red sandstones with *auracurites* are also included in the group. II. Carboniferous formation: grey sandstones and carboniferous shales; coal-seams without accompanying bituminous shales, and without a fauna which can be brought into relation or connection with the permian. The flora shows no admixture of permian types.—In the second article I. Niedzwiedzki gives some account of the basalt rocks met with in the carboniferous basin near Moravian Ostraw; and the other papers in the number are On the occurrence of Tertiary formations: in the upper region of the Maritza valley, that is, between the Balkan and the Rhodope mountains in Rumili; and Contributions to the geology of the Fruska Gora in Syrmia.—There are only two geological papers in No. 4, the first of which is a very long contribution, by F. Posepny, On the lead and cadmia veins of Raibl in Carinthia, which is well illustrated with coloured lithographs, showing sections of various vein-stores, ores, minerals, &c., and a map of the workings, &c.—The second paper is by Dr. Mojsisovics, On some triassic fossils from the South Alps; two plates accompany the paper.—Among the “Mineralogical Communications,” so carefully edited by Dr. Tschermak, there is one paper of somewhat general interest, An outline of a mechanical theory of the laws of crystallisation, by Dr. J. Hirschwald.

Verhandlungen des naturhist. Vereins d. pr. Rheinlande u. Westphalens, 29ter u. 30ter Jahrgang.—The former of these volumes contains, among other papers, one On Vesuvius, by Von Rath and Von Lasaulx; On the structure of Trilobites, by Von Koenen; On the effect of extreme cold on plants, by Mohr; On *Monas prodigiosa*, by Prof. Binz of Bonn; On the pupil of the fox, by Troschel; On benzyl-sulpho-cyanates, by Kekulé; and others on technical points of medicine. In the latter we may note Dr. Braun's description of the Upper Jura, with a geological section; Dr. Umber's measurements of the skulls of numerous mammalia, in which he attempts to find a criterion of their intelligence in the proportion of the anterior to the posterior part of the basis cranii (according to his results the Carnivora are inferior to the Quadrumana; and Horses to Rodents and Marsupials); two papers on the geological and palæontological features of the cave at Balm: one by Rindfleisch On tubercular inflammation; and one by Kekulé On allyl compounds.

SOCIETIES AND ACADEMIES LONDON

Royal Society, June 11.—Note on the alleged existence of Remains of a Lemming in Cave-deposits of England, by Prof. Owen, F.R.S.

Note on the Absorption-Spectra of Potassium and Sodium at low temperatures, by H. E. Roscoe, F.R.S., and Arthur Schuster.

In order to obtain the absorption-spectrum afforded by the well-known green coloured potassium vapour, pieces of the clean dry metal were sealed up in glass tubes filled with hydrogen, and one of these was then placed in front of the slit of a large Stein-

hill's spectroscope, furnished with two prisms having refracting angles of 45° and 60°. The magnifying power of the telescope was 40, and was sufficient clearly to separate the D lines with one prism. A continuous spectrum from a lime-light was used, and that portion of a tube containing the bright metallic globule of potassium was gently heated until the green vapour made its appearance. A complicated absorption spectrum was then seen, a set of bands (*a*) in the red coming out first, whilst after a few moments two other groups appeared on either side of the D lines, the group *β* (less refrangible) being not so dark as the group *γ*. These bands are all shaded off towards the red, and in general appearance resemble those of the iodine spectrum. In order to assure ourselves that the bands are not caused by the presence of a trace of an oxide, tubes were prepared in which the metal was melted in hydrogen several times on successive days until no further change in the bright character of the globule could be perceived. On vapourising the metal, which had been melted down to a clean portion of the tube, the bands were seen as before, and came out even more clearly, the globule, after heating, exhibiting a bright metallic surface. An analysis of the potassium used showed that it did not contain more than 0.8 per cent. of sodium, although, of course, the double line D was always plainly seen.

In order to ascertain whether an alteration in the absorption-spectrum of the metal takes place at a red heat, fragments of potassium were placed in a red-hot iron tube, through which a rapid current of pure hydrogen gas was passed, the ends of the tube being closed by glass plates. The magnificent green colour of the vapour was clearly seen at this temperature on looking through the tube at a lime-light placed at the other end. Owing, doubtless, to the greater thickness or increased pressure of the vapour, the bands seen by the previous method could not be resolved by the small spectroscope employed, the whole of the red being absorbed, whilst a broad absorption-band in the greenish yellow was seen occupying the place of the group *γ*.

The positions of the bands obtained by the first method were measured by means of a telescope and distant scale, and the wave-lengths obtained by an interpolation curve, for which well-known air-lines were taken as references. The following numbers give the wave-lengths of the most distinct, that is, the most refrangible edge of each band. As the measurements had to be quickly made owing to the rapid darkening of the glass by the action of the metallic vapour, these numbers do not lay claim to very great accuracy, but fairly represent the relative positions of the band, and show that they do not always occur at regular intervals, although they are pretty regularly spread over the field, and all are shaded alike.

Bands of potassium shaded off towards red. Wave-length in tenth metre:—

6844	6459	6311	5949	5763
6762	6430	6300	5930	5745
6710	6400	6275	5901	5732
6666	6379	6059	5860	5712
6615	6357	6033	5842	5700
6572	6350	6012	5821	5690
6534	6331	5988	5802	5674
6494	6322	5964	5781	5667

The bright potassium lines in the red and violet were not seen reversed, the intensity of the lime-light being too small at both extremes to render an observation possible.

In order to ascertain whether the vapour of sodium, which, when seen in thin layers, appears nearly colourless, exhibits similar absorption-bands, tubes containing the pure metal, which had been prepared and preserved out of contact with any hydrocarbon, were prepared, the metal being obtained free from oxide and the absorption-spectrum being observed in the manner already described. As soon as the metal began to boil a series of bands in the blue (*Na γ*) made their appearance, and shortly afterwards bands in the red and yellow (*Na α*), stretching as far as the D lines, came out. At this period of the experiment the D lines widened, thus blotting out a series of fine bands occurring in the orange (*Na β*), some of which could in consequence not be mapped. All the bands of the sodium-spectrum shade off like the potassium bands towards the red.

When the vapour of sodium is examined in a red-hot iron tube the colour of the lime-light as seen through it is a dark blue. As the sodium is swept away by the current of hydrogen passing through the colour becomes lighter, and the transmitted rays can be analysed by the spectroscope. At first the whole red and green and part of the blue is cut out entirely. The D lines are